

CLAIMS

What is claimed is:

1. A multi-rate speech codec that performs silence description coding of a speech signal having varying characteristics, the multi-rate speech codec comprising:
 - a voice detection circuit that identifies a substantially speech-like characteristic of the speech signal;
 - a processing circuit communicatively coupled to the voice detection circuit, the processing circuit selectively applies a predetermined coding mode to the speech signal upon the identification of the substantially speech-like characteristic of the speech signal; and
 - the predetermined coding mode is selected from a plurality of coding modes.
2. The multi-rate speech codec of Claim 1, wherein the voice detection circuit performs voice activity detection.
3. The multi-rate speech codec of Claim 1, wherein the plurality of coding modes comprises a coding mode having a lowest bit rate; and
 - the predetermined coding mode is the coding mode having the lowest bit rate.
4. The multi-rate speech codec of Claim 1, wherein the predetermined coding mode comprises a plurality of speech coding parameters; and
 - the plurality of speech coding parameters comprises a gain and a plurality of linear prediction coefficients.

5. The multi-rate speech codec of Claim 1, wherein the silence description coding comprises a subset of speech coding parameters selected from a plurality of speech coding parameters.

6. The multi-rate speech codec of Claim 1, wherein the predetermined coding mode comprises a source coding, a signaling coding and a channel coding.

7. The multi-rate speech codec of Claim 1, wherein the predetermined coding mode comprises a random excitation.

8. The multi-rate speech codec of Claim 1, wherein the predetermined coding mode performs an error checking.

9. The multi-rate speech codec of Claim 1, wherein the speech signal is partitioned into a plurality of speech signal segments; and

the processing circuit selectively applies the predetermined coding mode to at least one of the speech signal segments independent of at least one additional predetermined coding mode that the processing circuit selectively applies to at least one of a past speech signal segment, a present speech signal segment, and a future speech signal segment.

10. A multi-rate speech codec that performs silence description coding of a speech signal having varying characteristics, the multi-rate speech codec comprising:

a speech classification circuit that identifies a substantially speech-like characteristic of the speech signal;

an encoder processing circuit communicatively coupled to the speech classification circuit, the encoder processing circuit performs source coding of the speech signal;

a decoder processing circuit communicatively coupled to the speech classification circuit and the encoder processing circuit, the decoder processing circuit uses the source coding to generate a reproduced speech signal is substantially imperceptible to the speech signal; and

at least one of the encoder processing circuit and the decoder processing circuit performs error checking of the source coding of the speech signal.

11. The multi-rate speech codec of Claim 10, wherein the speech classification circuit is contained, at least in part, within at least one of the encoder processing circuit and the decoder processing circuit.

12. The multi-rate speech codec of Claim 10, wherein the error checking is performed prior to the decoder processing circuit generating the reproduced speech signal.

13. The multi-rate speech codec of Claim 10, wherein the source coding is selected from a plurality of coding modes; and

the source coding comprises a signaling coding and a channel coding.

14. The multi-rate speech codec of Claim 10, wherein the speech classification circuit performs voice activity detection.

15. The multi-rate speech codec of Claim 10, wherein the decoder processing circuit employs a random excitation to generate the reproduced speech signal.

16. A multi-rate speech coding method that performs silence description coding of a speech signal having varying characteristics, the multi-rate speech coding method comprising:
identifying a substantially speech-like characteristic of the speech signal;
selecting a predetermined coding mode from a plurality of coding modes; and
selectively applying the predetermined coding mode to the speech signal upon the identification of the substantially speech-like characteristic of the speech signal.

17. The multi-rate speech coding method of Claim 16, wherein the speech signal is partitioned into a plurality of speech signal segments; and
the predetermined coding mode is selectively applied to at least one of the speech signal segments independent of at least one additional predetermined coding mode that the processing circuit selectively applies to at least one of a past speech signal segment, a present speech signal segment, and a future speech signal segment.

18. The multi-rate speech coding method of Claim 16, wherein the predetermined coding mode comprises an available bandwidth; and
further comprising performing an error checking to assist in selectively applying the predetermined coding mode to the speech signal.

19. The multi-rate speech coding method of Claim 16, further comprising generating a reproduced speech signal that is perceptibly imperceptible to the speech signal; and wherein the reproduced speech signal is generated using a random excitation.

20. The multi-rate speech coding method of Claim 16, further comprising performing an error checking to assist in selectively applying the predetermined coding mode to the speech signal; and wherein

the error checking employs majority voting; and

the silence description coding comprises a subset of speech coding parameters selected from a plurality of speech coding parameters.

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FIG. 10 is a block diagram of the system.